



Janet Napolitano  
Governor

# ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007  
(602) 771-2300 • [www.azdeq.gov](http://www.azdeq.gov)



Stephen A. Owens  
Director

## Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Yuma Area on February 19, 2007

### Background

The Arizona Department of Environmental Quality (ADEQ) issues Dust Control Action Forecasts for the Yuma and Phoenix areas as part of the Natural Events Action Plan for these areas. On Sunday February 18, 2007, in response to an approaching low pressure disturbance, ADEQ air quality forecasters issued the Yuma and Vicinity Dust Control Action Forecast which called for a moderate risk of wind-blown dust for Monday February 19<sup>th</sup>. The forecast predicted breezy southerly winds ahead of the approaching system. Wind speeds of 10-20 mph were expected early, with decreasing winds as the day progressed (see attachment). This potential wind-blown dust event equated to a moderate risk of exceeding the PM<sub>10</sub> National Ambient Air Quality Standards (NAAQS) in the Yuma area. The forecasts/advisories satisfy the requirement in 40 CFR 51.920(a)(1).

Strong winds were observed in areas south and west of the Yuma area as a low pressure system approached Arizona on February 19, 2007. The initialization of the wind-blown dust event was evident in the National Weather Service (NWS) monitors. The NWS monitors in southeastern California at El Centro and Imperial recorded strong westerly sustained winds greater than 20 mph and wind gusts above 30 mph throughout most of the day. While the Yuma NWS and Arizona Meteorological Network (AzMET) stations did not record strong, sustained winds throughout the day, they did report southerly and

southeasterly winds greater than 15 mph during the 12 a.m. and 1 a.m. hours. Additional reports of haze and reduced visibility occurred shortly thereafter, with stronger winds beginning in the 3 a.m. hour and continuing throughout the 11 a.m. hour (see attachments). It appears that gusty, southerly winds in Northern Mexico were strong enough to pick up and suspend loose soil, transport it as airborne dust, and deposit this particulate matter into the Yuma area, where the winds were not as strong. The relatively light winds in the Yuma area allowed for particulate matter to remain in the air throughout the morning hours of February 19<sup>th</sup> until westerly winds increased during the afternoon hours as the frontal system passed, clearing the dust and haze from the air. All appropriate state implementation plan (SIP) control measures were in place during the event demonstrating, per 40 CFR 50.1(j), that the event "is not reasonably controllable or preventable."

The significant wind event in southeastern California and Northern Mexico brought elevated ambient concentrations of PM<sub>10</sub> to the Yuma area that exceeded the NAAQS at the Yuma Courthouse, Yuma Supersite, and Mexico Supersite monitors operated by ADEQ. The fact that ambient concentrations exceed the NAAQS satisfies the criteria in 40 CFR 50.1(j) that the event "affects air quality."

The following are the key PM<sub>10</sub> monitor readings for the monitors examined in this report:

Monitor (Operator/Type)	AQS ID*	24-hr Avg PM <sub>10</sub>	1-hr Max PM <sub>10</sub>	Time of Max 1-hr	Flag**
<b>YUMA AREA</b>					
<b>Yuma Courthouse (ADEQ/BAM)</b>	<b>04-027-0004*</b>	<b>183</b>	<b>818</b>	<b>0400</b>	<b>A or RJ</b>
<b>Yuma Supersite (ADEQ/BAM)</b>	<b>04-027-8011*</b>	<b>193</b>	<b>835</b>	<b>0400</b>	<b>A or RJ</b>
<b>Mexico Supersite (ADEQ/BAM)</b>	<b>80-026-8012*</b>	<b>247</b>	<b>647</b>	<b>0700</b>	<b>A or RJ</b>

\* EPA Air Quality System Identification Number

\*\* 24-hr PM<sub>10</sub> concentration influenced by natural or exceptional event to be flagged.

Type Abbreviations: BAM – Beta-Attenuation Mass Monitor (Continuous monitor)

The preliminary findings from this analysis were presented at a stakeholders meeting on November 13, 2007, and were made available for public review during a comment period that ended November 30, 2007. During that time, no comments were received from the public. ADEQ presented and discussed this final demonstration at a stakeholder

meeting on May 28, 2008. ADEQ has finalized this demonstration, which was made available for public comment from August 11, 2008, through September 10, 2008. Any comments that were received were forwarded to EPA with this demonstration pursuant to 40 CFR 51.14(c)(3)(i).

NWS-EI Centro, CA									
Hr	T(F)	VR	Dust	Spd	Gust	Dir			
1	63	10		17	17	SW			
2	61	10		11	11	SW			
3	62	10		15	15	W			
4	61	10		15	15	W			
5	60	10		29	34	W			
6	58	10		29	37	W			
7	57	10		16	16	W			
8	60	10		14	14	W			
9	60	10		15	15	W			
10	63	10		17	17	W			
11	64	10		17	17	W			
12	65	10		18	18	W			
1	65	10		20	20	W			
2	64	10		25	32	W			
3	65	10		21	21	W			
4	65	10		21	21	W			
5	62	10		18	18	W			
6	60	10		20	20	W			
7	60	10		21	26	W			
8	59	10		15	15	W			
9	59	10		16	16	W			
10	60	10		20	20	W			
11	59	10		18	18	W			
12	59	10		14	14	W			

NWS-Imperial, CA									
Hr	T(F)	VR	Dust	Spd	Gust	Dir			
1	63	10		15	15	SW			
2	60	10		8	8	SW			
3	60	10		5	5	S			
4	60	10		17	17	W			
5	61	10		20	20	W			
6	58	10		17	30	W			
7	57	10		22	22	W			
8	61	10		10	10	W			
9	62	10		21	21	W			
10	64	10		18	24	W			
11	63	10		17	17	W			
12	66	10		18	26	W			
1	65	10		13	13	W			
2	65	10		21	29	W			
3	67	10		21	24	W			
4	67	10		18	18	W			
5	62	10		17	17	W			
6	61	10		14	23	W			
7	60	10		16	16	W			
8	59	10		15	15	W			
9	58	10		10	10	W			
10	60	10		18	18	W			
11	59	10		14	14	W			
12	60	10		13	13	W			

NWS-YUMA MCAS									
Hr	T(F)	VR	Dust	Spd	Gust	Dir			
1	62	10		18	18	SE			
2	60	10		15	15	S			
3	58	5		11	11	S			
4	58	4		7	7	SE			
5	58	5		3	3	E			
6	58	6		5	5	E			
7	57	8		3	3	SE			
8	57	3 HZ		7	7	SE			
9	58	3 HZ		6	6	NW			
10	60	4 HZ		5	5	W			
11	63	6 HZ		5	22	VR			
12	64	10		10	10	W			
1	65	10		7	7	W			
2	64	10		5	5	W			
3	67	10		10	10	W			
4	66	10		10	10	W			
5	65	10		10	10	W			
6	64	10		8	8	W			
7	62	10		9	9	NW			
8	61	10		5	5	NW			
9	60	10		5	5	N			
10	59	10		6	6	N			
11	57	10		5	5	SW			
12	57	10		0	0	N			

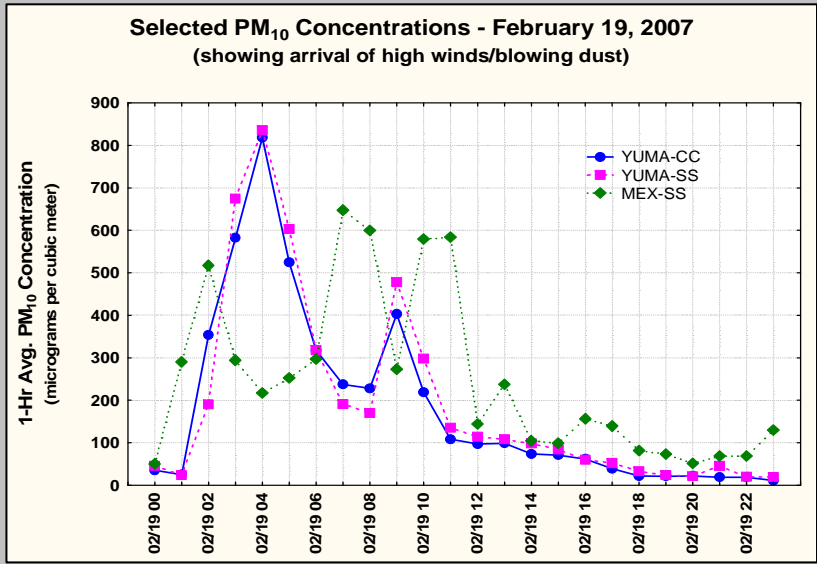
Event Contrib. Analysis									
Hourly PM <sub>10</sub> Conc. (µg/m <sup>3</sup> )									
MONITORS:									
1-MEX-SS		1	50	35	46				
2-YUMA-CH		2	290	25	24				
3-YUMA-SS		3	517	354	190				
24-Hr. Avg PM <sub>10</sub>		5	217	818	835				
Monitor:	with w/o	Event	Event						
1-MEX-SS	247	92	647	237	191				
2-YUMA-CH	183	48	599	228	170				
3-YUMA-SS	193	58	273	403	478				
> NAAQS	< NAAQS	11	579	219	298				
Pink=Event Contrib.		12	584	108	135				
Conclusion: As shown above, the PM <sub>10</sub> concentration would have been below the NAAQS "BUT FOR" the event contribution (hours highlighted in pink).		1	144	97	114				
		2	237	99	108				
		3	104	74	98				
		4	99	71	84				
		5	156	62	60				
		6	139	39	52				
		7	81	22	33				
		8	73	21	24				
		9	51	22	21				
		10	68	19	43				
		11	68	19	20				
		12	130	11	19				



**Figure 1. Key Data for Event of February 19, 2007**

MISC DATA	KEY	PM10 PLOT
CEN. AZ WINDS	SAT IMAGES	YUMA MAP & FORECAST
SO AZ WINDS		

**SUMMARY OF EVENT**  
Winds from the south-southeast transported PM<sub>10</sub> from Mexico into the Yuma area. Monitors at the Yuma Courthouse and Supersite tracked one another during the episode. The NWS reported diminished visibility in the region from 2:42 am until 10:51 am.



PARKER									
Hr	T(F)	RH	Rn	Spd	Max	Dir			
1	59	43	-	3	6	SE			
2	57	48	-	6	10	S			
3	54	57	-	9	23	S			
4	55	58	-	13	20	S			
5	52	67	-	7	12	S			
6	52	68	-	5	8	S			
7	53	67	-	4	8	SE			
8	55	65	-	5	10	S			
9	55	70	-	9	16	SW			
10	55	79	-	13	22	S			
11	53	83	0.03	9	23	S			
12	57	71	0.01	11	16	S			
1	62	58	-	10	19	S			
2	64	43	-	16	23	SW			
3	64	44	-	17	26	SW			
4	64	42	-	14	23	SW			
5	63	41	-	10	19	W			
6	59	57	-	9	14	SW			
7	59	54	-	8	13	SW			
8	59	53	-	6	10	W			
9	58	59	-	5	11	W			
10	54	74	-	3	7	S			
11	55	67	-	3	10	SW			
12	55	65	-	4	6	SW			

BUCKEYE							
	Hr	T(F)	RH	Rn	Spd	Max	Dir
26-Buckeye	1	58	26	-	2	5	E
	2	58	27	-	1	4	E
	3	57	29	-	2	7	E
	4	55	32	-	4	7	SE
	5	53	37	-	3	7	SE
	6	57	46	-	11	19	SW
	7	58	56	-	13	18	SW
	8	55	66	-	6	11	S
	9	57	64	-	5	11	S
	10	59	61	-	7	13	S
	11	59	62	-	7	12	SW
	12	57	82	0.04	6	14	SW
1	57	78	0.09	11	29	SW	
2	50	97	0.12	6	17	NW	
3	51	89	0.11	5	22	SW	
4	53	81	0.01	7	12	S	
5	56	73	-	6	11	S	
6	53	82	0.08	7	17	NW	
7	50	87	-	5	9	NE	
8	50	91	-	4	8	SE	
9	49	93	0.12	6	12	SE	
10	48	96	0.01	7	10	E	
11	48	96	-	7	11	E	
12	48	95	-	3	8	E	

## Assessment under the Technical Criteria Document (TCD)

1. Properly qualify and validate the air quality measurement to be flagged. As this was not a filter sampling date (1-in-6 run day), only data from the continuous analyzers were examined. The air quality monitoring data were reviewed by the agency responsible for operation of the monitor. All hourly PM<sub>10</sub> readings from the Yuma Courthouse, Mexico Supersite, and Yuma Supersite were valid. Audits of the analyzers revealed operations were within acceptable tolerance. No local sources were reported as significantly contributing to the air quality episode.

2. Review suspected contributing sources. The NWS and AzMET surface data from SE California and SW Arizona provide a good explanation of the meteorological conditions that were in place on February 19<sup>th</sup>. Strong, westerly winds were occurring in SE California behind a frontal boundary, while southerly winds were occurring ahead of the front in northern Mexico and the Yuma area. Clear air mode radar loops from the Yuma radar indicate southerly flow in northern Mexico with moderate echo returns being detected in northern Mexico heading towards the Yuma area. It is possible that these echoes are returns from pockets of blowing dust caused by the southerly flow ahead of the front. Haze reports in Yuma were coincident with relatively light winds just prior to the frontal passage, which may have allowed transported dust to remain in the air over the Yuma area for an extended period of time. The plot of hourly PM<sub>10</sub> concentration data in the upper right corner of Figure 1 confirms the identical timing of elevated PM<sub>10</sub> concentrations at both Yuma Courthouse and Yuma Supersite monitors. PM<sub>10</sub> concentrations also spiked at the Mexico Supersite, though slightly out of phase with the two Yuma sites. Finally, reduced visibility at the Yuma Marine Corps Air Station was coincident with elevated PM<sub>10</sub> concentrations at the three flagged sites.

3. Examine all air quality monitoring information. Data from all monitors in the network were reviewed. Monitors from the affected areas are summarized in the table in the Background section of this assessment. Pursuant to 40 CFR 50.14(c)(3)(iii)(C), the "Historical Distribution" Table in Figure 1 has been included to demonstrate that the event is associated with measured concentrations in excess of normal historical fluctuations, including background (i.e., concentrations greater than the 95<sup>th</sup> percentile). Monitors with readings greater than that of the NAAQS on February 19, 2007, which should be flagged, include Yuma Courthouse, Yuma Supersite, and Mexico Supersite.

4. Examine the meteorological conditions before and during the event. The AzMET meteorological data are summarized in Figure 1. The wind data are highlighted yellow if the max wind speed in the hour exceeds 15 mph and orange if it exceeds 25 mph. While strong westerly winds were in place in SE California behind the frontal boundary, relatively light winds occurred in the Yuma area just prior to the frontal passage, which may have allowed for transported dust from northern Mexico to remain in the air for an extended period of time. Westerly winds arrived in the Yuma area as the frontal boundary passed and PM<sub>10</sub> concentrations steadily decreased thereafter.

5. Perform a qualitative attribution to emission source(s). All evidence indicates the elevated PM<sub>10</sub> concentrations in the Yuma area can be attributed to soil emissions that were transported over a broad area. No source-specific emission allocation is possible based on the data available for analysis. The hourly concentration data do not show any significant source other than the wind-blown dust event occurring on February 19<sup>th</sup>. Observational reports of haze and blowing dust from trained officials in Yuma are further proof that the elevated PM<sub>10</sub> concentrations were attributed to soil emissions. The National Oceanic and Atmospheric Administration (NOAA) Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) model was utilized to indicate the possible source region for the elevated PM<sub>10</sub> event and illustrate the flow prior to, during, and following the frontal passage (see attachment).

6. Estimation of Contribution from Source or Event. The primary source appears to be wind-blown dust over SE California, northern Mexico, and SW Arizona for which there is not an effective or efficient method to estimate the relative contributions from specific sources. The demonstration analysis contained in this report establishes the linkage between the measurements to be flagged and the event, thus satisfying the requirement in 40 CFR 50.14(c)(3)(iii)(B). Pursuant to 40 CFR 50.14(c)(3)(iii)(D), the "Event Contrib. Analysis" Table in Figure 1 has been included to demonstrate that there would have been no exceedances or violations but for the event (i.e., the contribution during the event overwhelmed the 24-hour averages).

7. Determination that a Natural or Exceptional Event Contributed To an Exceedance. Based on this analysis, the event satisfies the requirement in 40 CFR 50.1(j) that the elevated concentrations at the flagged monitoring sites were attributed to a natural event.

## Conclusion

Long-range transport of dust from soils. The region wide elevated PM<sub>10</sub> event on February 19, 2007 in Yuma was the result of the transport of dust and soils from high winds that suspended natural soils and soils from areas where Best Available Control Measures are in place and should be

flagged for air quality planning purposes. The "high wind" flag (A or RJ) should be applied to the monitor readings indicated in the table at the beginning of this report, as the monitor would have been below the NAAQS but for the contribution of the event.



**YUMA AND VICINITY  
DUST CONTROL ACTION FORECAST  
ISSUED SUNDAY, FEBRUARY 18, 2007**

Three-day weather outlook:

A rather weak upper low and trough will approach and move over the Yuma area on Monday and Tuesday and bring a slight chance of showers and thunderstorms both days. Winds will be breezy on Monday ahead of the system then relatively light on Tuesday except near showers and thunderstorms.

**WINDS**

**WIND-BLOWN DUST RISK**

**Day #1: Mon 02/19/2007**

South to southwesterly  
10-20 mph.

**MODERATE**

**Day #2: Tue 02/20/2007**

No significant winds  
expected.

**LOW**

**Day #3: Wed 02/21/2007**

No significant winds  
expected.

**LOW**

**PM-10 & PM-2.5 (PARTICLES)**

Description – The term “particulate matter” (PM) includes both solid particles and liquid droplets found in air. Many manmade and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. Particles less than 10 micrometers in diameter tend to pose the greatest health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter are referred to as “fine” particles and are responsible for many visibility degradations (brown cloud). Particles with diameters between 2.5 and 10 micrometers are referred to as “coarse”.

Sources – Fine = All types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. Coarse = crushing or grinding operations and dust from paved or unpaved roads.

Potential health impacts – PM can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases, such as asthma and chronic bronchitis.

Units of measurement – Micrograms per cubic meter (ug/m3)

Averaging interval – 24 hours (midnight to midnight).

Reduction tips – Stabilize loose soils, minimize travel on dirt roads, utilize tarps on haul trucks, limit use of leaf-blowers, and on high-wind days reduce outdoor activities.

CKR 05/09/2005



U.S. Department of Commerce  
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL  
CLIMATOLOGICAL DATA  
(final)  
HOURLY OBSERVATIONS TABLE  
NAF (23199)  
EL CENTRO , CA  
(02/2007)**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801

Elevation: -43 ft. below sea level

Latitude: 32.817

Longitude: -115.667

Data Version: VER3

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
19	0056	5	CLR	10.00		63	17.2	51	10.8	40	4.4	43	17	240		29.80			29.80	AA		29.76
19	0156	5	CLR	10.00		61	16.1	51	10.7	42	5.6	50	11	230		29.78			29.78	AA		29.74
19	0256	5	SCT110	10.00		62	16.7	52	11.0	42	5.6	48	15	250		29.78	3	010	29.78	AA		29.74
19	0356	5	CLR	10.00		61	16.1	52	11.0	43	6.1	52	15	260		29.79			29.79	AA		29.75
19	0456	5	FEW070 SCT090	10.00		60	15.6	51	10.2	41	5.0	50	29	260		29.82	5	002	29.83	AA		29.78
19	0556	5	CLR	10.00		58	14.4	49	9.5	40	4.4	51	29	260	34	29.83			29.83	AA		29.79
19	0656	5	BKN100	10.00		57	13.9	48	8.8	38	3.3	49	16	250	37	29.87			29.88	AA		29.83
19	0756	5	CLR	10.00		60	15.6	49	9.4	37	2.8	43	14	270		29.89	3	028	29.90	AA		29.85
19	0856	5	BKN110	10.00		60	15.6	49	9.6	38	3.3	44	15	270		29.92			29.92	AA		29.88
19	0956	5	FEW100	10.00		63	17.2	50	10.1	37	2.8	38	17	250		29.92	1	018	29.93	AA		29.88
19	1056	5	FEW110	10.00		64	17.8	52	10.8	39	3.9	40	17	260		29.94			29.94	AA		29.90
19	1156	5	SCT110	10.00		65	18.3	52	10.9	38	3.3	37	18	260		29.92			29.93	AA		29.88
19	1256	5	SCT100	10.00		65	18.3	52	10.9	38	3.3	37	20	260		29.91	8	005	29.91	AA		29.87
19	1356	5	BKN110	10.00		64	17.8	51	10.6	38	3.3	38	25	260	32	29.90			29.91	AA		29.86
19	1456	5	BKN100	10.00		65	18.3	52	10.9	38	3.3	37	21	250		29.91			29.91	AA		29.87
19	1556	5	SCT080 BKN095	10.00		65	18.3	52	11.1	39	3.9	39	21	260		29.91	3	000	29.91	AA		29.87
19	1656	5	FEW080	10.00		62	16.7	51	10.3	39	3.9	43	18	250		29.92			29.93	AA		29.88
19	1756	5	FEW080 BKN090	10.00		60	15.6	50	9.8	39	3.9	46	20	250	26	29.95	3	018	29.95	AA		29.91
19	1856	5	OVC095	10.00		60	15.6	50	10.0	40	4.4	48	21	250		29.96			29.97	AA		29.92
19	1956	5	BKN090	10.00		59	15.0	50	9.8	40	4.4	50	15	260		29.98			29.98	AA		29.94
19	2056	5	BKN100	10.00		59	15.0	50	9.8	40	4.4	50	16	260		30.01	1	020	30.01	AA		29.97
19	2156	5	OVC090	10.00		60	15.6	51	10.3	41	5.0	50	20	250		30.02			30.03	AA		29.98
19	2256	5	BKN100	10.00		59	15.0	50	10.0	41	5.0	51	18	260		30.04			30.04	AA		30.00
19	2356	5	BKN075 OVC100	10.00		59	15.0	51	10.2	42	5.6	54	14	260		30.05			30.05	AA		30.01

Dynamically generated Mon Oct 29 12:21:05 EST 2007 via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>

U.S. Department of Commerce  
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL  
CLIMATOLOGICAL DATA  
(final)  
HOURLY OBSERVATIONS TABLE  
IMPERIAL COUNTY AIRPORT (03144)  
IMPERIAL , CA  
(02/2007)**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801

Elevation: -59 ft. below sea level

Latitude: 32.834

Longitude: -115.579

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
19	0053	12	CLR	10.00		63	17.2	51	10.6	39	3.9	41	15	240		29.80			29.74	AA		29.74
19	0153	12	CLR	10.00		60	15.6	50	10.0	40	4.4	48	8	240		29.80			29.74	AA		29.74
19	0253	12	FEW120	10.00		60	15.6	51	10.2	41	5.0	50	5	200		29.80	3	005	29.73	AA		29.74
19	0351	12	CLR	10.00		61	16.0	52	11.0	43	6.0	52	16	260		29.80			M	SP		29.74
19	0353	12	CLR	10.00		60	15.6	51	10.5	42	5.6	52	17	260		29.80			29.74	AA		29.74
19	0453	12	BKN070 OVC090	10.00		61	16.1	51	10.7	42	5.6	50	20	260		29.83	3	001	29.76	AA		29.77
19	0553	12	CLR	10.00		58	14.4	49	9.5	40	4.4	51	17	260	30	29.85			29.78	AA	T	29.79
19	0653	12	FEW090	10.00		57	13.9	48	9.0	39	3.9	51	22	260		29.88	3	024	29.81	AA	T	29.82
19	0753	12	CLR	10.00		61	16.1	49	9.6	37	2.8	41	10	290		29.91			29.85	AA		29.85
19	0853	12	SCT070 SCT100	10.00		62	16.7	51	10.3	39	3.9	43	21	270		29.92			29.85	AA		29.86
19	0953	12	BKN110	10.00		64	17.8	51	10.6	38	3.3	38	18	250	24	29.94	1	023	29.88	AA		29.88
19	1053	12	OVC085	10.00		63	17.2	51	10.6	39	3.9	41	17	280		29.95			29.89	AA		29.89
19	1153	12	FEW110	10.00		66	18.9	52	10.9	37	2.8	34	18	250	26	29.93			29.87	AA		29.87
19	1253	12	BKN095	10.00		65	18.3	52	10.9	38	3.3	37	13	250		29.93	8	006	29.86	AA		29.87
19	1353	12	BKN090	10.00		65	18.3	52	10.9	38	3.3	37	21	260	29	29.92			29.85	AA		29.86
19	1453	12	BKN085 BKN100	10.00		67	19.4	53	11.6	39	3.9	36	21	270	24	29.92			29.85	AA		29.86
19	1553	12	OVC090	10.00		67	19.4	53	11.6	39	3.9	36	18	260		29.92	5	001	29.86	AA		29.86
19	1653	12	CLR	10.00		62	16.7	51	10.3	39	3.9	43	17	260		29.93			29.87	AA		29.87
19	1753	12	OVC090	10.00		61	16.1	50	10.1	39	3.9	44	14	270	23	29.96			29.90	AA		29.90
19	1853	12	FEW100	10.00		60	15.6	50	10.0	40	4.4	48	16	260		29.97	3	018	29.91	AA		29.91
19	1953	12	CLR	10.00		59	15.0	50	9.8	40	4.4	50	15	260		29.99			29.93	AA		29.93
19	2053	12	CLR	10.00		56	13.3	48	9.0	40	4.4	55	10	260		30.02	1	020	29.96	AA		29.96
19	2153	12	OVC095	10.00		60	15.6	51	10.3	41	5.0	50	18	250		30.03			29.97	AA		29.97
19	2253	12	FEW090 BKN100	10.00		59	15.0	50	10.0	41	5.0	51	14	250		30.05			29.99	AA		29.99
19	2353	12	OVC080	10.00		60	15.6	51	10.5	42	5.6	52	13	260		30.06			30.00	AA		30.00

Dynamically generated Mon Oct 29 12:27:09 EST 2007 via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>

U.S. Department of Commerce  
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL  
CLIMATOLOGICAL DATA  
(final)  
HOURLY OBSERVATIONS TABLE  
YUMA MCAS (03145)  
YUMA , AZ  
(02/2007)**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801

Elevation: 213 ft. above sea level

Latitude: 32.650

Longitude: -114.617

Data Version: VER3

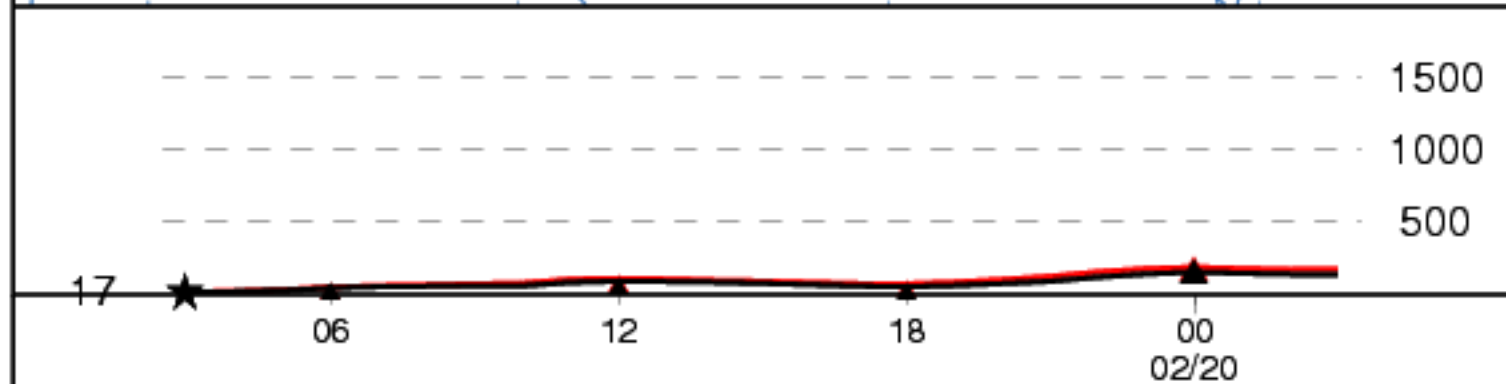
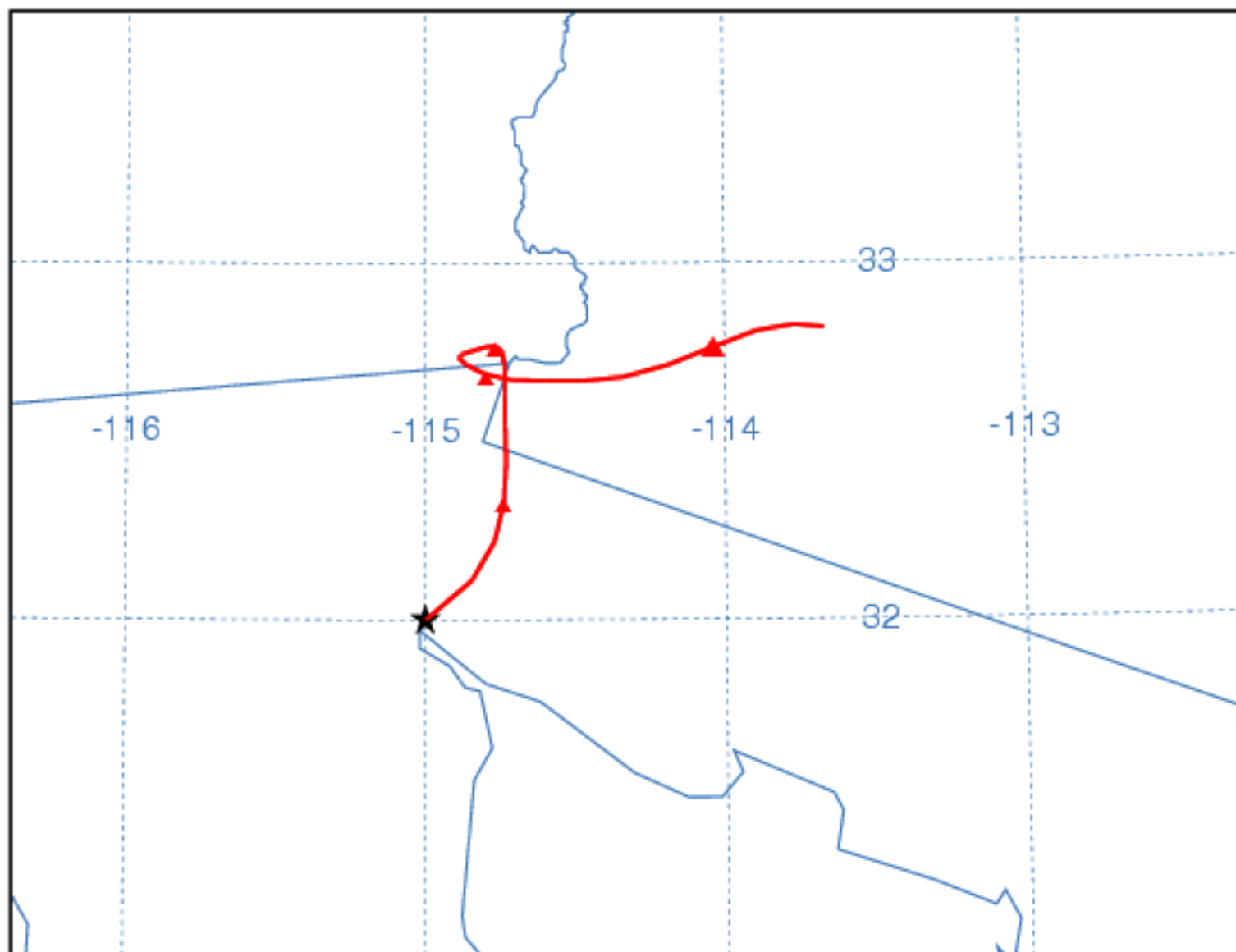
Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
19	0051	5	CLR	10.00		62	16.7	52	11.2	43	6.1	50	18	150		29.52			29.73	AA		29.75
19	0151	5	CLR	10.00		60	15.6	51	10.7	43	6.1	54	15	160		29.53			29.75	AA		29.76
19	0234	5	SCT005	10.00		57	14.0	50	9.9	43	6.0	60	11	160		29.52	3	003	M	SP		29.75
19	0242	5	BKN005	8.00		57	14.0	50	9.9	43	6.0	60	10	170		29.52			M	SP		29.75
19	0249	5	BKN003	6.00		57	14.0	50	9.9	43	6.0	60	10	170		29.52			M	SP		29.75
19	0251	5	BKN003	5.00		58	14.4	50	9.9	42	5.6	55	11	180		29.52			29.74	AA		29.75
19	0308	5	SCT003	4.00		57	14.0	49	9.5	41	5.0	55	10	150		29.53			M	SP		29.76
19	0328	5	BKN001	4.00		57	14.0	49	9.5	41	5.0	55	10	140		29.53			M	SP		29.76
19	0351	5	OVC001	4.00		58	14.4	50	10.0	42	5.6	55	7	140		29.53			29.75	AA		29.76
19	0451	5	OVC001	5.00		58	14.4	51	10.7	45	7.2	62	3	090		29.54	3	002	29.75	AA		29.77
19	0534	5	SCT001 SCT021	5.00		57	14.0	51	10.7	46	8.0	67	6	080		29.55			M	SP		29.78
19	0551	5	CLR	6.00		58	14.4	52	10.9	46	7.8	65	5	110		29.55			29.77	AA		29.78
19	0651	5	SCT080 BKN150	8.00		57	13.9	52	11.0	47	8.3	69	3	120		29.57			29.79	AA		29.80
19	0726	5	FEW070 SCT080	2.00	HZ	57	14.0	51	10.7	46	8.0	67	7	130		29.58			M	SP		29.81
19	0743	5	SCT080	2.50	HZ	57	14.0	51	10.7	46	8.0	67	6	130		29.59			M	SP		29.82
19	0751	5	BKN060	2.50	HZ	57	13.9	52	11.0	47	8.3	69	7	140		29.60	3	021	29.82	AA		29.83
19	0758	5	BKN070	2.50	HZ	57	14.0	51	10.7	46	8.0	67	6	140		29.60			M	SP		29.83
19	0815	5	FEW030 BKN080	3.00	HZ	57	14.0	51	10.7	46	8.0	67	5	140		29.60			M	SP		29.83
19	0851	5	SCT030 BKN060	3.00	HZ	58	14.4	52	11.2	47	8.3	67	6	300		29.63			29.85	AA		29.86
19	0951	5	SCT030	4.00	HZ	60	15.6	52	10.9	44	6.7	56	5	250		29.64			29.86	AA		29.87
19	0958	5	FEW001	5.00	HZ	61	16.0	53	11.4	45	7.0	56	5	220		29.64			M	SP		29.87
19	1051	5	FEW030	6.00	HZ	63	17.2	52	11.0	41	5.0	45	5	VR	22	29.66	1	020	29.88	AA		29.89
19	1151	5	FEW030 SCT060	10.00		64	17.8	52	10.8	39	3.9	40	10	260		29.66			29.88	AA		29.89
19	1251	5	FEW030 BKN060 BKN100	10.00		65	18.3	52	10.8	38	3.3	37	7	270		29.65			29.87	AA		29.88
19	1351	5	FEW030 BKN060 BKN100	10.00		64	17.8	51	10.6	38	3.3	38	5	270		29.64	8	006	29.86	AA	T	29.87
19	1451	5	FEW030 SCT060 BKN100	10.00		67	19.4	52	11.3	38	3.3	35	10	280		29.63			29.85	AA		29.86
19	1551	5	CLR	10.00		66	18.9	52	11.1	38	3.3	36	10	260		29.63			29.85	AA		29.86
19	1651	5	CLR	10.00		65	18.3	52	10.8	38	3.3	37	10	290		29.63	5	002	29.85	AA	T	29.86
19	1751	5	CLR	10.00		64	17.8	51	10.6	38	3.3	38	8	290		29.64			29.86	AA	T	29.87
19	1851	5	SCT100	10.00		62	16.7	51	10.3	39	3.9	43	9	320		29.67			29.88	AA		29.90
19	1951	5	SCT080	10.00		61	16.1	50	9.8	38	3.3	43	5	320		29.69	3	019	29.91	AA		29.92
19	2051	5	CLR	10.00		60	15.6	50	9.8	39	3.9	46	5	340		29.71			29.93	AA		29.94
19	2151	5	CLR	10.00		59	15.0	49	9.5	39	3.9	48	6	340		29.74			29.96	AA		29.97
19	2251	5	BKN070	10.00		57	13.9	48	9.0	39	3.9	51	5	240		29.76	3	024	29.98	AA		29.99
19	2351	5	BKN065	10.00		57	13.9	48	9.0	39	3.9	51	0	000		29.78			30.00	AA		30.01

Dynamically generated Mon Oct 29 12:52:43 EST 2007 via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>

NOAA HYSPLIT MODEL  
Forward trajectory starting at 03 UTC 19 Feb 07  
EDAS Meteorological Data

Source ★ at 32.00 N 115.00 W

Meters MSL



Job ID: 377551 Job Start: Mon Apr 28 21:19:09 GMT 2008  
Source 1 lat.: 32.0 lon.: -115.0 hghts: 1, 5, 10 m AGL

Trajectory Direction: Forward Duration: 24 hrs Meteo Data: EDAS40  
Vertical Motion Calculation Method: Model Vertical Velocity  
Produced with HYSPLIT from the NOAA ARL Website (<http://www.arl.noaa.gov/ready/>)